



Review

Injuries and absenteeism among motorcycle taxi drivers who are victims of traffic accidents



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ABSTRACT

Facial injuries frequently occur in traffic accidents involving motorcycles. The purpose of this study was to determine the prevalence of facial injuries among motorcycle drivers who perform motorcycle taxi service. The study design was cross-sectional. A total of 210 participants who served as motorcycle taxi drivers in a city in northeastern Brazil completed a survey concerning their experience of accidents involving facial injuries and consequent hospitalization and absenteeism from work. The motorcycle drivers included in the study were randomly selected from a list provided by the city. Out of the respondents, 165 (78.6%) who were involved in traffic accidents in the last 12 months, 15 (9.1%) reported facial injuries. The types of facial injury most frequently reported involved soft tissues ($n = 8$; 53.3%), followed by simple fracture ($n = 4$; 26.7%) and dentoalveolar fracture ($n = 3$; 20%). We found an association between facial injuries and absenteeism, as well as an association between the presence of facial injury and the need for hospitalization for a period of 2 days or more. Respondents reported that they had accidents, but due to the use of full face motorcycle helmet the number of facial injuries was low. For most of them, absenteeism was observed for a period of one month or more.

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1. Introduction

Road accidents involving motorcycle drivers are frequently associated with three types of facial injuries: soft tissue trauma, dentoalveolar fracture, and simple fracture.¹ Dentoalveolar fractures include injuries to teeth, support tissues, and alveolar bone,² while simple facial fractures leave little, if any trace of fracture on the face.³

The main causes of all facial injuries are accidents involving motorcycles, followed by accidents involving automobiles and urban violence.^{4–10} Survivors of motorcycle accidents often have more severe lesions than do people injured via other methods.^{11,12} The severity of lesions may explain the longer stays of motorcycle drivers in hospitals and their longer absence from work.

Since 2009, the motorcycle taxi service in Brazil has been recognized as a profession, and is regulated by Federal Law No. 12,009/09¹³; however, it has not lost its informal character, since clandestine services continue to operate. The law requires that the driver be at

least 21 years old and have at least 2 years of driving experience with motorcycles in order to qualify for professional practice.

In emerging countries such as Brazil, young men are more affected than older men in cases of facial injuries resulting from traffic accidents.^{14–17} In Brazil, the prevalence of facial injuries among motorcycle drivers who have suffered accidents was 52.2%,¹⁸ well above the 24.3% found among motorcyclists who have suffered accidents in California, USA.¹⁹

The motorcycle is used in some Brazilian cities for transporting passengers, similar to a taxi service, and has become known as the "mototaxi." The present study aimed to determine the prevalence of facial injuries among mototaxi drivers in a medium-sized city in northeastern Brazil, to describe the types of facial injuries sustained by mototaxi drivers, and to evaluate the occurrence of hospitalization and absenteeism associated with these injuries.

2. Methods

A cross-sectional study was conducted with mototaxi drivers in a city with 385,213 inhabitants, considered one of the main centers of economic development of the Brazilian Northeast.²⁰ In this city, there are three types of mototaxi services: drivers registered at the municipal agency, the Superintendent of Traffic and Public

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Transport (STPT) (Group 1; $n = 727$); professional drivers working for a private company (Group 2; $n = 308$); and an unspecified number of individuals not authorized to transport people, who are acting clandestinely in the capacity of mototaxi driver (Group 3).

As inclusion criteria for the study, participants were required to be part of Group 1 or Group 2. By national law, respondents' workweek is 44 h, distributed over the seven days of the week, but not exceeding 8 h daily and containing a weekly rest period of 24 h. Those in Group 3 were excluded from the analysis because there was no way of knowing their actual number or obtaining their contact information, since they are not considered legal professionals. Drivers included in the study had driven motorcycles for at least one year. The research was performed between August and October 2011.

We developed a questionnaire to gather information about the occurrence of accidents in the past 12 months. The questionnaire consisted of questions related to demographic data (age, sex, education, and period of license), traffic accidents (occurrence of absenteeism and hospitalization), and facial injuries (presence, type, and location). The questionnaire was tested in a pilot study of 57 drivers. The dependent variable in this study was the occurrence of facial trauma, while the independent variables were age, education, and duration of license.

The population for the study consisted of 1035 registered and private mototaxi drivers. The pilot study found a 7.5% prevalence of facial injury. According to the results of this pilot study, we estimated the sample size using a 95% confidence level and a 7.5% expected prevalence for facial trauma. The minimum sample size required was, thus, 181 mototaxi drivers.

The present sample comprised 210 mototaxi drivers selected by simple random sampling from two lists, one supplied by the STPT and the other by a private enterprise, using the Epi-Info 7 epidemiological statistics program. The interviews were conducted by telephone. When a selected participant was not found, or if that individual refused to participate in this study, another was randomly selected from the list. Refusal to participate in the study was less than 2%. Payment was not offered to participants. On average, participants answered the questionnaire in 10 min.

A similar procedure was used by Hashim and Iqbal,¹ who collected their data from the medical records of hospitalized victims of motorcycle accidents. Despite the similarity of these studies, we must note that collecting injury data from hospital records, which are the typical sources of data in retrospective studies of this nature, may lead to bias due to lack of information from incomplete or poorly written medical records.

The method used in this study attempted to reduce this limitation by interviewing each individual in the sample. We reduced the possibility of recall bias by limiting the classification of injury to three types: soft tissue injury, dentoalveolar fracture, and facial fracture.¹ By using this classification, the respondent would be less likely to confuse the types of trauma. We defined a traffic accident as any collision suffered with another vehicle, object, or pedestrian, as well as a fall that the motorcycle driver may have suffered.

Descriptive statistics included frequency distributions and percentages. Inferential statistical techniques included the chi-square test or Fisher's exact probability test when the conditions for using Pearson's chi-square test were not met. The level of significance used in the statistical tests was 5%. The software used for data entry and statistical calculations was SPSS (Statistical Package for the Social Sciences) Version 17.

The study followed the national and international recommendations regarding research involving human beings (Resolution 196/96 National Health and the Helsinki Declaration). The project was approved by the Ethics Committee in Research, Universidade Estadual da Paraíba (CAAE N: 0091.0.133.000-11).

3. Results

All study participants were men ($N = 210$), among whom 165 (78.6%) had at least one type of traffic accident in the past 12 months. Injuries to the facial region affected 15 individuals (9.1%). Those with such injuries were 18–45 years old, had 8 years of education, and had held a driver's license for 11 or more years. There was no statistically significant association between these variables and the occurrence of facial injury (Table 1).

The descriptive analysis of the type of facial injuries revealed that most occurred in the soft tissues (53.3%, $n = 8$), followed by simple fractures (26.7%, $n = 4$) and dentoalveolar fractures (20%, $n = 3$). Helmet use was reported by 98.2% ($n = 162$) of mototaxi drivers who had accidents.

We found a statistically significant association between the occurrence of a facial injury and being hospitalized for a period of two days or more. Absenteeism was verified for most participants, lasting for a period of one month or more. There was a statistically significant association between the occurrence of facial injury and absence from work; however, the length of absence showed no such association (Table 2).

4. Discussion

This study found a high prevalence of traffic accidents involving mototaxi drivers, but most accidents did not injure the facial region. A possible explanation for the low prevalence of facial injuries may be the use of protective equipment, since most drivers reported using a full-face motorcycle helmet. Brazilian traffic law mandates the use of helmets for drivers and passengers who use motorcycles.¹³ The city where the study was conducted has efficient law enforcement. Due to this factor and fearing fines, few drivers are caught traveling by motorcycle on public roads without using a helmet. A previous study of facial trauma involving motorcycle drivers performed in the same county showed that facial injuries were more frequent,²¹ but there was no indication whether the drivers involved used the motorcycle as a means of work. Thus, it was not possible to make a direct comparison with our study.

The occurrence of facial injuries was higher among younger drivers (age 18–35) and adults (age 36–45) than it was in the older group (age 46 or more). Other studies have shown that people in their second decade of life are more likely to be involved in cases of facial injury.^{1,22–25} In this study, we found no difference between

Table 1
Association between facial injury and sample characteristics.

Variable	Facial injury			<i>p</i> Value
	Yes <i>n</i> (%)	No <i>n</i> (%)	Total group <i>N</i> (%)	
Total	15 (9.1)	150 (90.9)	165 (100.0)	
Age (y)				
18–35	7 (11.9)	52 (88.1)	59 (100.0)	<i>p</i> ^a = 0.212
36–45	7 (10.9)	57 (89.1)	64 (100.0)	
≥46	1 (2.4)	41 (97.6)	42 (100.0)	
Education (y)				
<8	1 (3.3)	29 (96.7)	30 (100.0)	<i>p</i> ^b = 0.235
8–11	12 (12.6)	83 (87.4)	95 (100.0)	
≥11	2 (5.0)	38 (95.0)	40 (100.0)	
Years holding a driver's license				
<5	3 (13.6)	19 (86.4)	22 (100.0)	<i>p</i> ^b = 0.683
6–10	2 (8.7)	21 (91.3)	23 (100.0)	
≥11	10 (8.3)	110 (91.7)	120 (100.0)	

^a Pearson's chi-square.

^b Fisher's exact test.

Table 2

Association of facial injury among mototaxi drivers with hospitalization and absenteeism.

Variable	Facial injury			
	Yes n (%)	No n (%)	Total N (%)	p Value
Hospitalization				
Yes	12 (18.8)	52 (81.3)	64 (100.0)	^a p = 0.001*
No	3 (3.0)	98 (97.0)	101 (100.0)	
Total	15 (9.1)	150 (90.9)	165 (100.0)	
Period of Hospitalization				
<24 h	3 (7.3)	38 (92.7)	41 (100.0)	
≥48 h	9 (39.1)	14 (60.9)	23 (100.0)	
Total group ^c	12 (18.8)	52 (81.3)	64 (100.0)	^b p = 0.005*
Absenteeism				
Yes	13 (13.3)	85 (86.7)	98 (100.0)	^a p = 0.024*
No	2 (3.0)	65 (97.0)	67 (100.0)	
Total group	15 (9.1)	150 (90.9)	165 (100.0)	
Time off work				
<24 h	1 (7.1)	13 (92.9)	14 (100.0)	^b p = 0.053
48 h to 1 wk	2 (6.1)	31 (93.9)	33 (100.0)	
2–3 wk	1 (5.6)	17 (94.4)	18 (100.0)	
≥1 mo	9 (27.3)	24 (72.7)	33 (100.0)	
Total	13 (13.3)	85 (86.7)	98 (100.0)	

* Statistically significant association at the 5% level.

^a Pearson's chi-square.

^b Fisher's exact test.

^c Information was not available for 23 respondents.

young people and adults with regard to the occurrence of facial injury.

All study participants were men, suggesting that women are not interested in this kind of profession, perhaps because a motorcycle offers little protection¹ compared to other vehicles. It is also possible that a stereotype exists in society that only men are fit for this kind of service. However, as the study did not investigate why only men perform this service, we cannot confirm the reason.

Victims of injuries reported having low education, with the majority having eight or fewer years of education. This finding is similar to those of studies conducted in other Brazilian states involving motorcycle drivers.^{18,25,26}

The analysis showed that most drivers had considerable experience in driving these vehicles, having obtained their first license to drive motorcycles at least 11 years earlier. This considerable experience may have led drivers to more reckless and dangerous traffic conduct, thus increasing the risk of accidents, because more experienced drivers learned risky forms of driving.²⁷ However, less-experienced drivers may also pose a greater risk, given that such drivers exhibit relatively little skill in driving a motorcycle, a vehicle that offers little protection.

The involvement of mototaxi drivers in traffic accidents should be understood in the context of the growth in the number of mototaxis, which was brought about by the recent governmental accreditation of this industry; a similar situation occurred with motorcycle drivers who work for delivery services.^{23,26} In both lines of work, the need for speed and agility to compete with other drivers may result in risky behavior in traffic. A qualitative study involving these professionals uncovered a veiled competition among drivers, for whom speeding is a reason that the work has a high level of risk.²⁷ Generally, these professionals possess fixed routes; however, some of them travel through the streets in search of passengers. In this study, competition for passengers among the three modalities of mototaxi service (those registered, those from a private company) was observed.

When we looked at the distribution of the types of facial injuries that occurred, we found that soft tissue injuries were the most frequent. The skin of this region is the body's first defensive barrier

against physical attacks, providing protection to the underlying bones. Soft tissue injuries were followed in frequency by simple fractures and dentoalveolar fractures.¹ The involvement of bone and dentoalveolar fractures suggests that the accidents were of greater severity, although these injuries were less frequent in this study. Of note is that while most drivers were using helmets at the time of the accident, doing so does not ensure the absence of facial injuries.

One of the consequences of facial injury for mototaxi drivers was reflected by the victim's length of stay in the hospital; specifically, they spent an average of two or more days in the hospital. This length of hospitalization suggests the involvement of lesions requiring treatments that are more complex; otherwise, drivers would have been discharged a few hours after the initial treatment. Facial injuries normally require hospitalization and present the possibility of facial deformities and emotional sequelae to the involved person.^{28,29}

Another consequence for injured individuals is the lack of employment. We found a relationship between the occurrence of facial injuries and the need for absence from work. Absenteeism was likely caused by the accident severity. Accidents that caused major trauma may also have caused greater damage to the motorcycle, which would involve longer time for repairs to the vehicle.

Absence from work because of facial injuries affects both municipally registered drivers and those from private companies. Both groups must bear the consequences of the accident, including post-hospitalization and motorcycle expenses. These expenses represent economic injury to those involved, especially if the period of absenteeism is long. Many of the injured mototaxi drivers in this study needed to be absent from work for periods of a month or more. During their absence from work, remuneration is paid to accident victims through the National Social Security System. The amount paid falls in the minimum wage category, which at the time of data collection, was around US\$ 250.00.

Returning to work for victims of traffic accidents is a complex process, and one of the main determining factors of the time required for rehabilitation, and subsequently for returning to work, is the severity of their lesions.³⁰

One limitation of this study was possible recall bias of victims, a bias that is not present in studies that use medical records.

5. Conclusion

Respondents reported that they had accidents, but due to the use of full-face motorcycle helmet, the number of facial injuries was low. For most respondents, absenteeism was observed for a period of one month or more.

Conflict of interest

The authors declare no conflicts of interest.

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